

## CLAIMS

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1. A system for coupling a base station transmitter and a base station receiver to an antenna for a commercial mobile radio service (CMRS) system, comprising:

10 an antenna for radiating transmit signals to and receiving receive signals from mobile radio stations of a CMRS system;

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15 a plurality of receive branch networks, coupled to the antenna via a receive path and to the base receiver, each operative to select a frequency range of the receive signals for reception by the base station receiver and to pass the receive signals for processing by the remaining receive branch networks located in a downstream portion of the receive path; and

20 a plurality of transmit branch networks, coupled to the antenna via a transmit path and to the base transmitter, each operative to select a frequency portion of the transmit signals transmitted by the base transmitter for forwarding to the antenna and to accept all transmit signals forwarded by the remaining transmit branch networks in a downstream portion of the transmit path for forwarding to the antenna.

25 2. The system of Claim 1, wherein each receive branch network comprises:

30 a circulator, comprising a first port and a third port coupled to the receive path and a second port, operative to accept receive signals from an upstream portion of the receive path via the first port, to pass the receive signals via the second port to the third port and to the remaining receive branch networks located in the downstream portion of the receive path, and to output the receive signals via the second port; and

35 a filter, coupled between the second port of the circulator and the base receiver, operative to accept the receive signals from the second port of the circulator and to select the frequency range of the receive signals for processing by the base receiver.

5           3. The system of Claim 1, wherein each transmit branch network comprises:

          a filter, coupled to the base transmitter, operative to output filtered transmit signals in response to select the frequency portion of the transmit signal generated by the base transmitter; and

10           a circulator, comprising a first port and a third port coupled to the transmit path and a second port coupled to the filter, operative to accept at the second port the filtered transmit signals for forwarding via the third port to an upstream portion of the transmit path and to accept at the first port the transmit signals output by remaining transmit branch  
15 networks located in the downstream portion of the transmit path for forwarding via the third port to the upstream portion of the transmit path.

20           4. The system of Claim 1 further comprising an antenna circulator, coupled between the receive and transmit paths and to the antenna, for directing receive signals from the antenna to the receive path and transmit signals from the transmit path to the antenna.

25           5. The system of Claim 4 further comprising a bandpass filter, coupled between the antenna circulator and the receive path, for passing receive signals within a predetermined frequency range from the antenna circulator to the receive path while preventing the passage of transmit signals from the circulator to the receiver path.

30           6. The system of Claim 4 further comprising an isolator, coupled between the antenna circulator and the transmit path, for passing transmit signals to the antenna circulator from the transmit path while preventing the passage of receive signal from the antenna to the transmit path.

35           7. The system of Claim 1, wherein the base receiver comprises a plurality of channel receivers, each allocated a unique frequency range and coupled to one of the receive branch networks for processing receive signals within the unique frequency range.  
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5           8.    The system of Claim 1, wherein the base transmitter comprises a plurality of transmitters, each allocated a unique frequency range and coupled to one of the transmit branch networks for generating transmit signals within the unique frequency range.

10           9.    The system of Claim 2, wherein the filter of each receive branch network comprises a filtering characteristic selected from the group of bandpass, highpass and lowpass filter characteristics.

15           10.   The system of Claim 1, wherein the number of receive branch networks is not equal to the number of transmit branch networks.

20           11.   The system of Claim 3, wherein the filter of each transmit branch network comprises a filtering characteristic selected from the group of bandpass, highpass and lowpass filter characteristics.

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5        13. A system for coupling a base station transmitter and a base station receiver to an antenna for a commercial mobile radio service (CMRS) system, comprising:

an antenna for radiating transmit signals to and receiving receive signals from mobile radio stations of a CMRS system;

10        a plurality of receive branch networks, coupled to the antenna via a receive path and to the base receiver, each comprising:

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15        a circulator, comprising a first port and a third port coupled to the receive path and a second port, operative to accept receive signals from an upstream portion of the receive path via the first port, to pass the receive signals via the second port to the third port and to the remaining receive branch networks located in the downstream portion of the receive path, and to output the receive signals via the second port, and

20        a filter, coupled between the second port of the circulator and the base receiver, operative to accept the receive signals from the second port of the circulator and to select a frequency range of the receive signals for processing by the base receiver; and

a plurality of transmit branch networks, coupled to the antenna via a transmit path and to the base transmitter, each comprising:

25        a filter, coupled to the base transmitter, operative to output filtered transmit signals in response to selecting a frequency portion of the transmit signal generated by the base transmitter, and

30        a circulator, comprising a first port and a third port coupled to the transmit path and a second port coupled to the filter, operative to accept at the second port the filtered transmit signals for forwarding via the third port to an upstream portion of the transmit path and to accept at the first port the transmit signals output by remaining transmit branch networks located in the downstream portion of the transmit path for forwarding via the third port to the upstream portion of the transmit path.

40        14. The system of Claim 12 further comprising an antenna circulator, coupled between the receive and transmit paths and to the antenna, for directing receive signals from the antenna to the receive path and transmit signals from the transmit path to the antenna.

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15. The system of Claim 13 further comprising a bandpass filter, coupled between the antenna circulator and the receive path, for passing receive signals within a predetermined frequency range from the antenna circulator to the receive path while preventing the passage of transmit signals from the transmit path.

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16. The system of Claim 13 further comprising an isolator, coupled between the antenna circulator and the transmit path, for passing transmit signals to the antenna circulator from the transmit path while preventing the passage of receive signal from the antenna to the transmit path.

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17. The system of Claim 12, wherein the base receiver comprises a plurality of channel receivers, each allocated a unique frequency range and coupled to one of the receive branch networks for processing receive signals within the unique frequency range; and

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the base transmitter comprises a plurality of transmitters, each allocated a unique frequency range and coupled to one of the transmit branch networks for generating transmit signals within the unique frequency range.

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18. The system of Claim 12, wherein the number of receive branch networks are equal to the number of transmit branch networks.

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19. The system of Claim 12, wherein the number of receive branch networks are not equal to the number of transmit branch networks.

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